

Setting the scene – Air quality with focus on Danish conditions



Thomas Ellermann

DCE – Danish Center for Environment and Energy

Department of Environmental Research

Aarhus University



AARHUS
UNIVERSITET

DCE - NATIONALT CENTER FOR MILJØ OG ENERGI



19. NOVEMBER 2019

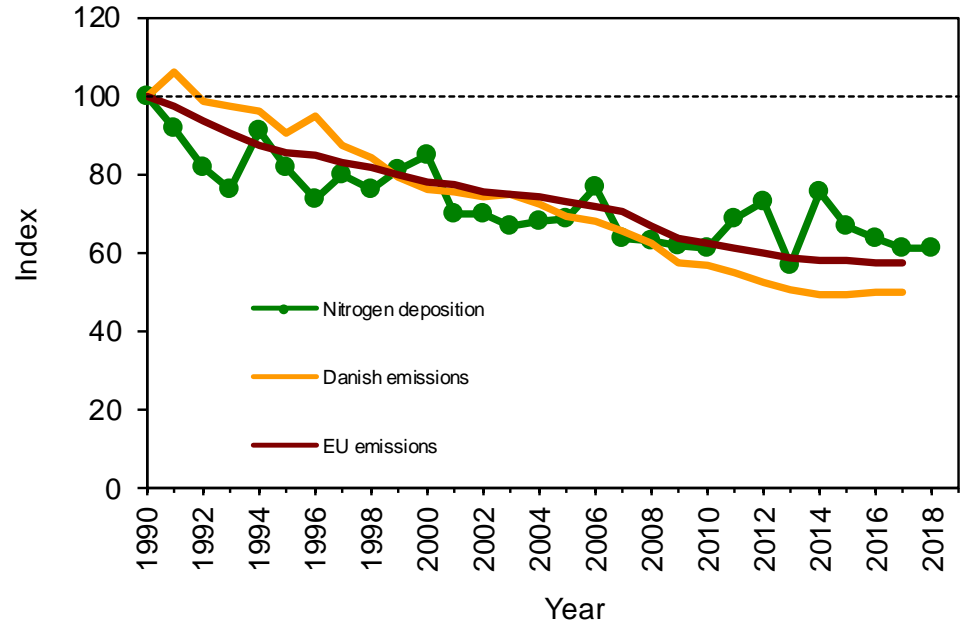
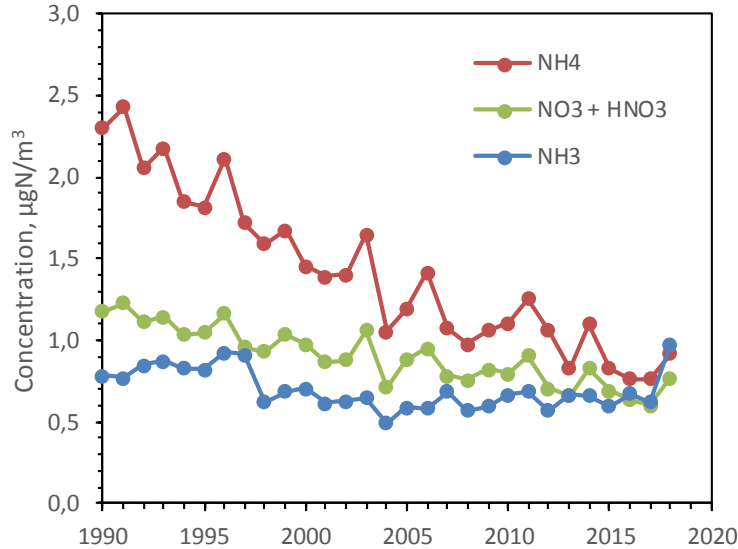
Air quality with focus on Danish Conditions

In Denmark, the concentrations of many air pollutants have been reduced to very low levels (SO₂, CO, Pb, Cd, Ni, As, Benzene.....)

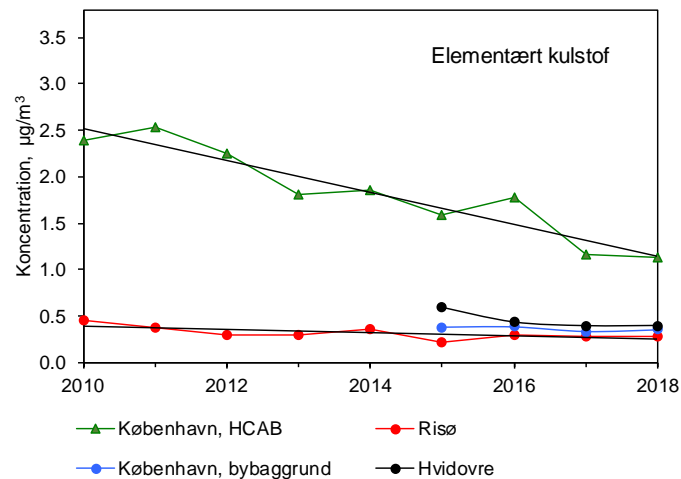
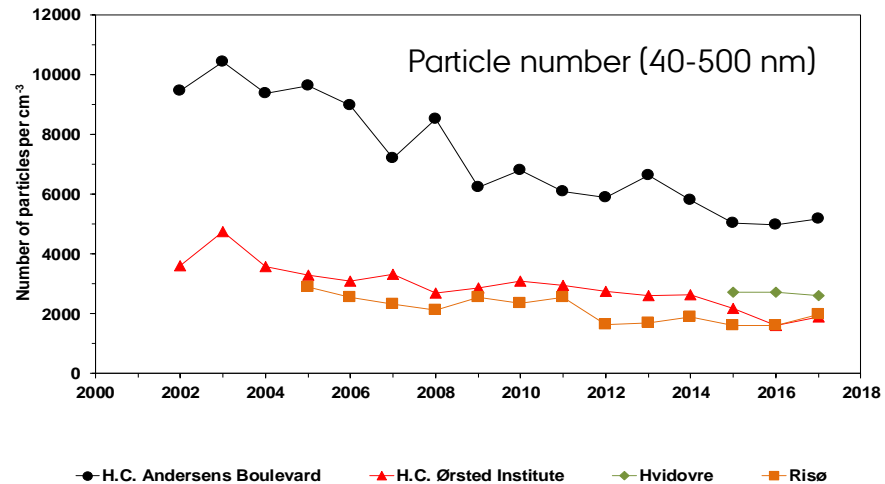
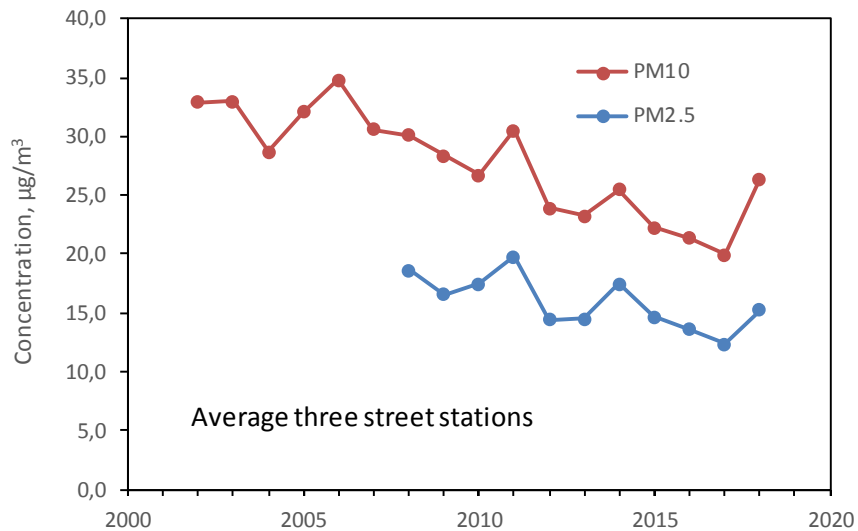
Still problems with eutrophication of sensitive ecosystems and aquatic environment

Significant impact on health - 4200 premature deaths annually in Denmark

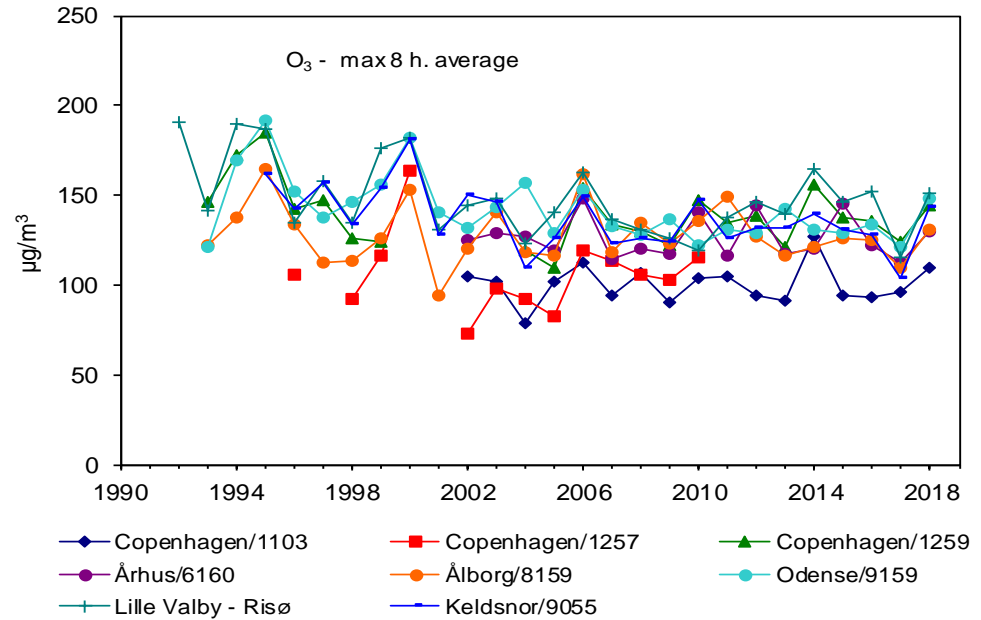
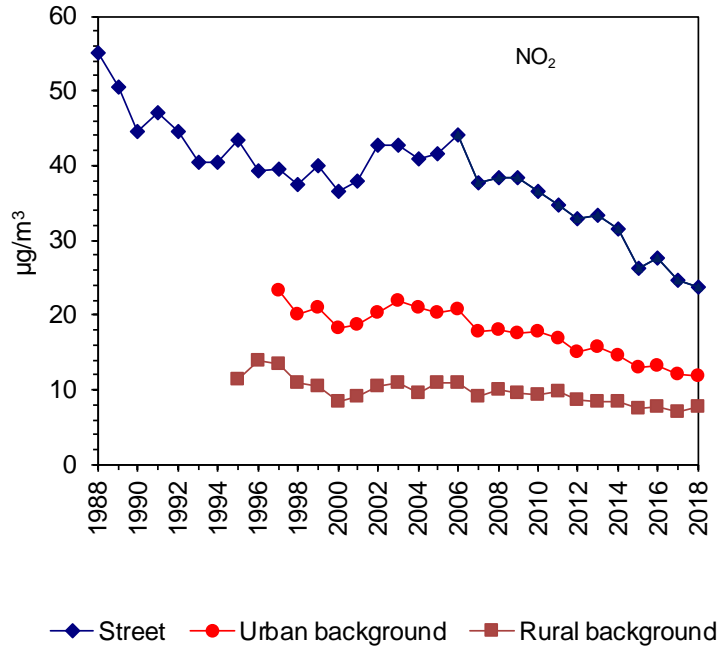
Nitrogen concentrations and deposition



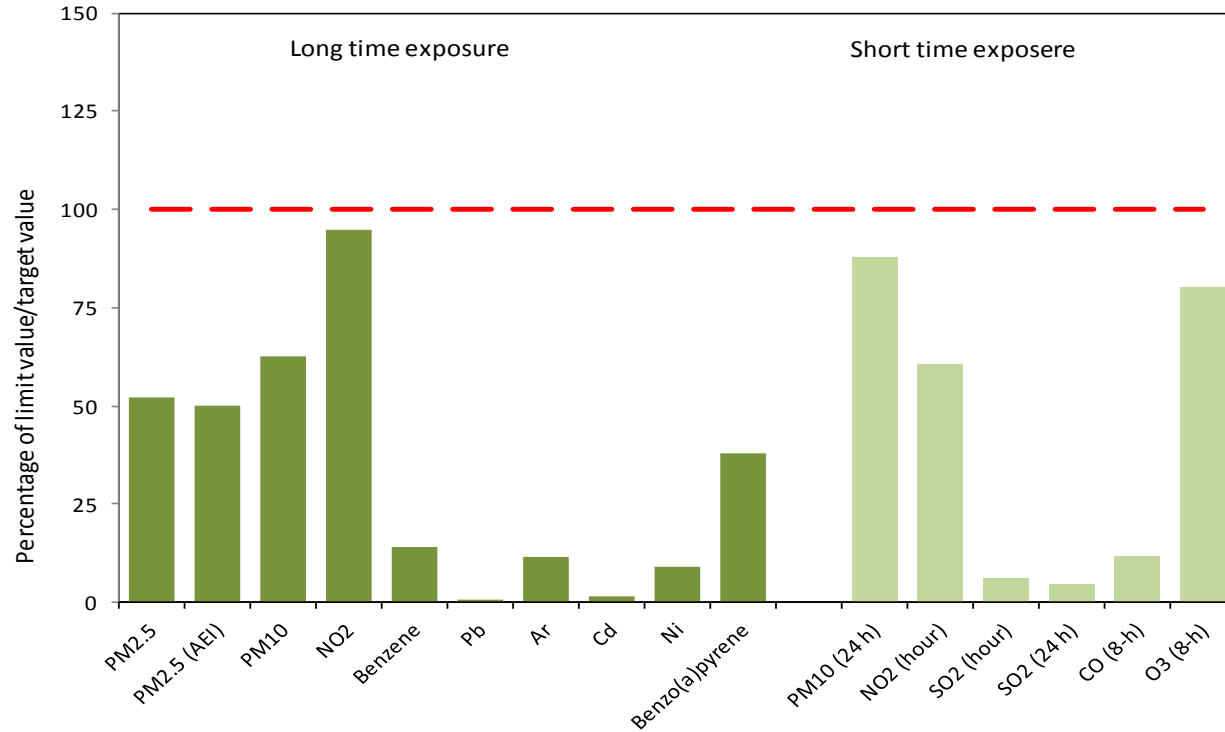
Compounds with impact on health - particles



Compound with impact on health - gasses



Compliance with EU limit and target values



C40 Clean Air Declaration



Clean Air Cities: Our Commitment to Healthy Air for Every Citizen

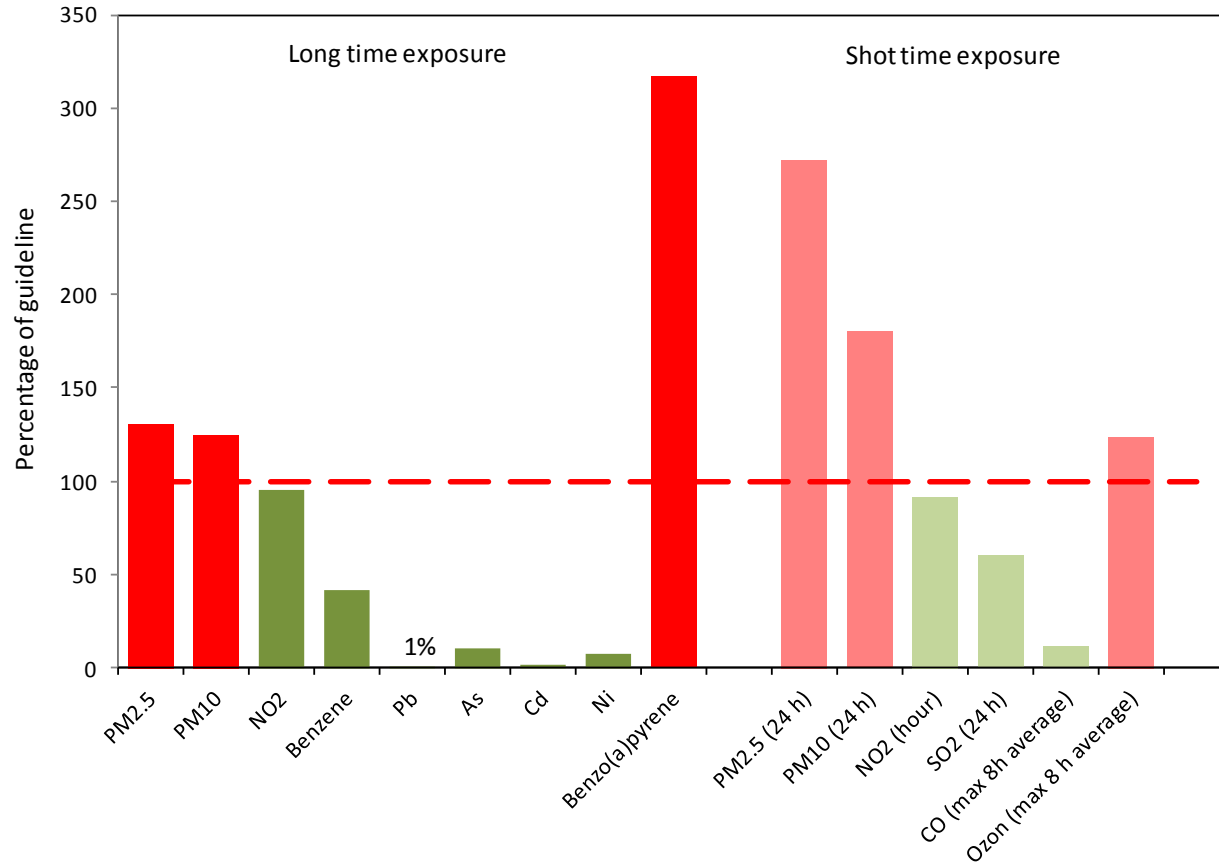
Nine out of 10 people around the world are breathing dirty air.¹ Not only does this lead to early death and increased disease, it impacts our economies and reduces opportunities for our citizens to thrive. It is the poorest and most vulnerable communities in our cities that are most at risk.

Together, we will work towards a shared vision of meeting World Health Organization Air Quality Guidelines by 2030.² We will use all the powers at our disposal as mayors to tackle air pollution, and call on others responsible for the sources of air pollution that poison the air in our cities to match this commitment.

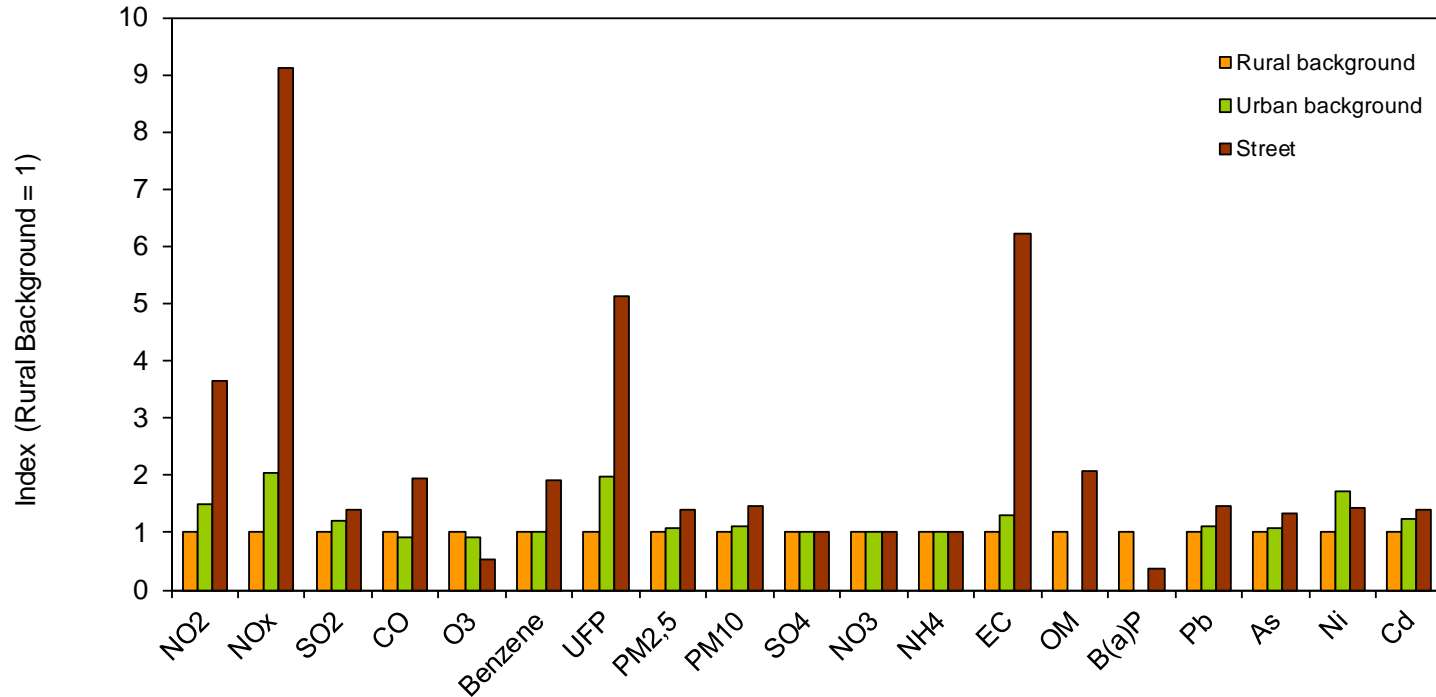
Amman, Austin, Bengaluru, Barcelona, Berlin, Buenos Aires, Copenhagen, Delhi, Dubai, Durban (eThekweni), Guadalajara, Heidelberg, Houston, Jakarta, Los Angeles, Lima, Lisbon, London, Madrid, Medellin, Mexico City, Milan, Oslo, Paris, Portland, Quezon City, Quito, Rotterdam, Seoul, Stockholm, Sydney, Tel Aviv-Yafo, Tokyo, Warsaw, Washington D.C.



WHO guidelines



Local, national and transboundary air pollution



Topics for further investigations

- What can be done to decrease the nitrogen deposition?
- Scientific evaluation of new set of limit values. How to implement limit values most effectively?
- Limit value for EC. EU-directive on workplace environment, carcinogenic effect of diesel particles $50 \mu\text{g EC}/\text{m}^3$. Danish Research Institute on Working Environment $0.45 \mu\text{g EC}/\text{m}^3$.
- Ultra fine particles. Health impact? Dose response relationship, limit value.
- Which chemical constituents of $\text{PM}_{2.5}$ are responsible for health impact?
- Wood burning – secondary particle formation/condensable
-





AARHUS
UNIVERSITET